WHAT IS CLAIMED IS:

1. A level measuring device operating with microwaves, particularly with microwave bursts, for producing a level value (X_H) representative of a level in
5   a vessel (200), said level measuring device comprising:

    a transceiver unit (2) for generating a level-dependent intermediate-
      frequency signal (ZF) by means of a transmit signal (S_2) and a receive
      signal (E_2);

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    a transducer element (1)

    which in operation couples transmitted waves (S_1), particularly pulsed waves, into the vessel (200) under control of the transmit signal (S_2) and which converts echo waves (E_1) reflected from contents (201) of the vessel
15   (200) into the receive signal (E_2); and

    a control unit (3) with a volatile data memory (33) for storing, at least
      temporarily, a sampling sequence (AF) representing the intermediate-
    frequency signal (ZF).
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2. A level measuring device as set forth in claim 1 which determines the level value (X_H) by means of amplitude information derived from the sampling sequence (AF).

25   3. A level measuring device as set forth in claim 2 which determines the level value (X_H) by means of phase information derived from the sampling sequence (AF).

4. A level measuring device as set forth in any one of claims 1 to 3

wherein the volatile data memory (33) holds, at least temporarily, a first

signal sequence (SIN_{AF}), which represents a numerically performed

multiplication of the sampling sequence (AF) by a digital sine-wave signal

sequence, and/or

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wherein the volatile data memory (33) holds, at least temporarily, a second

signal sequence (COS_{AF}), which represents a numerically performed

multiplication of the sampling sequence (AF) by a digital cosine-wave signal

sequence.

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5. A level measuring device as set forth in claim 4

wherein the volatile data memory (33) holds, at least temporarily, a first

quadrature-signal sequence (Q), which represents a numerically performed

15   downconversion of at least a portion of the first signal sequence (SIN_{AF}),

and/or

wherein the volatile data memory (33) holds, at least temporarily, a second

quadrature-signal sequence (I), which represents a numerically performed

downconversion of at least a portion of the second signal sequence (COS_{AF}).

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6. A level measuring device as set forth in claim 4 or 5

wherein the volatile data memory (33) holds, at least temporarily, a first

average-value sequence ($\overline{SIN_{AF}}$), which serves in particular to generate

25   the first quadrature-signal sequence (Q) and represents a variation of a time

average of at least a portion of the first signal sequence (SIN_{AF}), and/or

wherein the volatile data memory (33) holds, at least temporarily, a second

average-value sequence ($\overline{COS_{AF}}$), which serves in particular to generate

the second quadrature-signal sequence (I) and represents a variation of a time average of at least a portion of the second signal sequence (COS_{AF}).

7. A level measuring device as set forth in any one of claims 4 to 6 wherein
5   the volatile data memory (33) holds, at least temporarily, a data record (q_j/i_j) which corresponds to a phase of a data record (af_j) of the sampling sequence (AF) and represents a numerical division of a data record (q_j) of the first quadrature-signal sequence (Q) by an essentially equal-locus data record (i_j) of the second quadrature-signal sequence (I).
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8. A level measuring device as set forth in claim 7 wherein the volatile data memory (33) holds, at least temporarily, a first digital phase sequence (Q/I) which corresponds to a temporal phase variation of at least a portion of the intermediate-frequency signal (ZF).
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9. A level measuring device as set forth in any one of claims 1 to 3 wherein the volatile data memory (33) holds, at least temporarily, a digital envelope (ENV) which represents a temporal amplitude variation of the intermediate-frequency signal (ZF).
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10. A level measuring device as set forth in claim 9 wherein the volatile data memory (33) holds, at least temporarily, a data record (af_j/env_j) which corresponds to a phase of a data record (af_j) of the sampling sequence (AF) and represents a numerical division of said data record (af_j) by an essentially
25   equal-locus data record (env_j) of the envelope (ENV).

11. A level measuring device as set forth in claim 9 or 10 wherein the volatile data memory (33) holds, at least temporarily, a second digital phase

sequence (AF/ENV) which corresponds to a temporal phase variation of at least a portion of the intermediate-frequency signal (ZF).

5   12. A level measuring device operating with microwaves, particularly with microwave bursts, for producing a level value (X_H) representative of a level in a vessel (200), said level measuring device comprising:

a transceiver unit (2) for generating a level-dependent intermediate-frequency signal (ZF) by means of a transmit signal (S_2) and

10   a receive signal (E_2);

a transducer element (1)

which in operation couples waves (S_1), particularly pulsed waves, into the vessel (200) under control of the transmit signal (S_2) and which converts echo

15   waves (E_1) reflected from contents (201) of the vessel (200) into the receive signal (E_2); and

a control unit (3)

with a volatile data memory (33) for storing, at least temporarily, a digital

20   phase sequence (AF/ENV) which represents a normalization of the intermediate- frequency signal (ZF) to an amplitude variation of the intermediate-frequency signal (ZF) and which corresponds to a temporal phase variation of the intermediate frequency signal (ZF).

25   13. A level measuring device as set forth in claim 1 or 12 which comprises a logarithmic amplifier (37) for the intermediate-frequency signal (ZF).